

Solar

What Is Solar Energy?

Every day, the sun radiates (sends out) an enormous amount of energy—called **solar energy**. It radiates more energy in one day than the world uses in one year. This energy comes from within the sun itself.

Like most stars, the sun is a big gas ball made up mostly of hydrogen and helium gas. The sun makes energy in its inner core in a process called nuclear **fusion**.

It takes the sun's energy just a little over eight minutes to travel the 93 million miles to Earth. Solar energy travels at the speed of light, or 186,000 miles per second, or 3.0×10^8 meters per second.

Only a small part of the visible **radiant energy** (light) that the sun emits into space ever reaches the Earth, but that is more than enough to supply all our energy needs. Every hour enough solar energy reaches the Earth to supply our nation's energy needs for a year! Solar energy is considered a **renewable** energy source due to this fact.

Today, people use solar energy to heat buildings and water and to generate electricity. Solar energy accounts for a very small percentage of U.S. energy—less than one percent. Solar energy is mostly used by residences and to generate electricity.

Solar Collectors

Heating with solar energy is not as easy as you might think. Capturing sunlight and putting it to work is difficult because the solar energy that reaches the Earth is spread out over a large area. The sun does not deliver that much energy to any one place at any one time.

The amount of solar energy an area receives depends on the time of day, the season of the year, the cloudiness of the sky, and how close you are to the Earth's Equator.

A **solar collector** is one way to capture sunlight and change it into usable heat energy. A closed car on a sunny day is like a solar collector. As sunlight passes through the car's windows, it is absorbed by the seat covers, walls, and floor of the car. The absorbed light changes into heat. The car's windows let light in, but they don't let all the heat out. A closed car can get very hot!

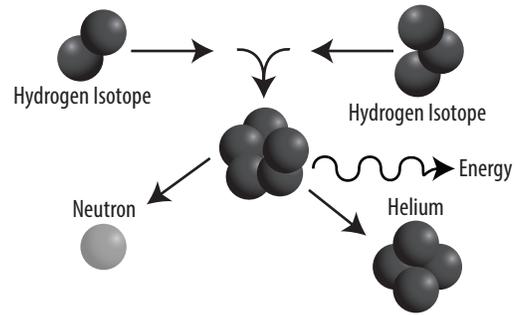
Solar Space Heating

Space heating means heating the space inside a building. Today, many homes use solar energy for space heating. A passive solar home is designed to let in as much sunlight as possible. It is like a big solar collector.

Sunlight passes through the windows and heats the walls and floor inside the house. The light can get in, but the heat is trapped inside. A **passive solar home** does not depend on mechanical equipment, such as pumps and blowers, to heat the house, whereas **active solar homes** do.

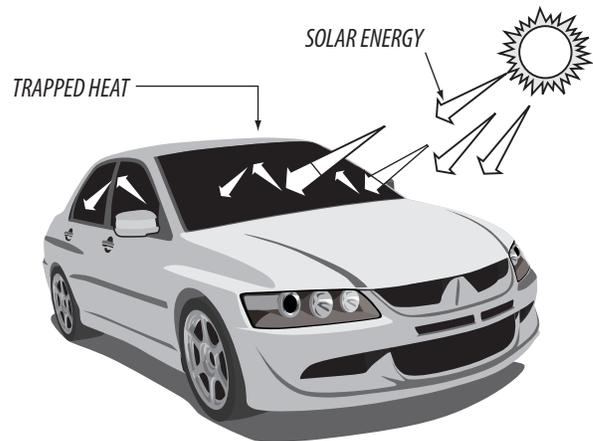
Fusion

The process of fusion most commonly involves hydrogen isotopes combining to form a helium atom with a transformation of matter. This matter is emitted as radiant energy.



Solar Collector

On a sunny day, a closed car becomes a solar collector. Light energy passes through the window glass, is absorbed by the car's interior, and converted into heat energy. The heat energy becomes trapped inside.



Passive Solar Home

